

Basic Principles of Motor Learning and Skill Acquisition

Motor Learning - process by which a person develops, through a combination of physical and psychological factors, the ability to perform a task

Although the muscles, tendons and bones would seem to be the primary factors involving coordinated movement, the study of motor development reveals that the *root of motor activity lies in the sensory and nervous systems.*

The senses must gather information about the context of the skill; nature of the activity, characteristics of the person performing the task and the external environment

I.e pitch shot in to a green
Foul shot in basketball

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"Practice makes Perfect" - having learned how to perform a certain action and having practiced it repeatedly, it becomes easier to perform that task again. Our perceptual system takes in information for processing, our memories recall similar events and allow us to react in what we perceive as a successful manner

The coordination of mind and body to produce a skill can be subdivided into two types of activity.

- i) Automatic Motor Activity - involves very little thought and results in an action that mimics an unconscious reflex action i.e Jordan Fade-Away Jump Shot
- ii) Controlled Motor Activity - requires more thought and time to produce action
i.e Splitting the defense in a hockey game

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Stages-of- Learning Model

When an athlete attempts to master complicated skills involved in elite sport performance, the athlete gradually passes through three important stages.

a) Cognitive Stage

-achieve a basic understanding of the task
i.e hockey player - aware of the basic rules of the game, efficient skating posture, ability to give and receive a pass and create a shot on net

-athletes will often make major errors in an effort to demonstrate a skill and require further instruction on how to approach the task (miss the puck while taking a shot on net)

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b) Associative Stage

- characterized as a refining of skills which produce a more consistent demonstration of skill
- athlete is able to determine the improper technique and adjust to make a more accurate result
- i.e follow through to a target line while throwing a football

c) Autonomous Stage

- skill becomes an almost automatic sequence of events
- athletes require little attention to the basic approach to a skill and can focus almost entirely on external factors
- i.e an approaching defender, position on court or a head-wind

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Factors effecting skill acquisition;
Incorrect understanding of movement
Poor physical ability
Poor coordination
Lack of concentration (distractions)
Appropriate equipment and clothing
External Factors i.e weather

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Phases of Movement

As humans grow and develop they follow phases of human movement to perform an increasingly complex set of motor skills.

A) Reflexive Movement (0-4months)

Newborn phase is the first instance in which humans control motor development (sub-cortex of brain)

B) Rudimentary Movement (birth to 2 years)

Stage is marked by; locomotor activity i.e crawling & walking, manipulation i.e picking up and releasing objects, and stability i.e gaining control of head and neck

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C) Fundamental Movement (2 to 7 years)

Develop basic movements which evolve into sports-related skills ie running, throwing and kicking. Within this stage athletes master initial, elementary and mature skills

D) Sport-Related Movement (7 years-Adulthood)

Subdivided into three distinct phases

- general phase (7-10 years) rudimentary movement become refined into sport-specific skills ie underhand toss-underhand serve
- specific stage (11-13 years) develops accuracy and complexity of skill ie shoot to a target
- specialized stage(14 years-adulthood) refined skills for further accuracy ie golf stroke

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